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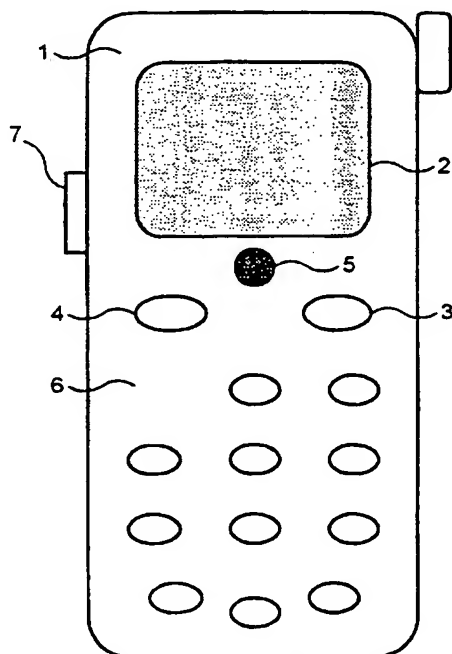
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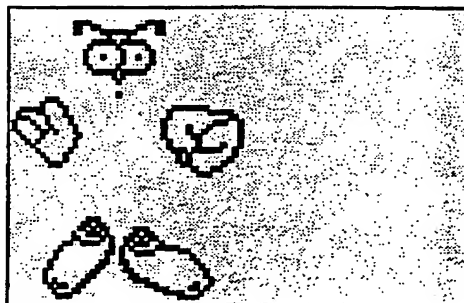
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(54) Title: **MOBILE TELEPHONE WITH IMPROVED MAN MACHINE INTERFACE**



START UP SCREEN - ENLARGED



(57) Abstract: Hence, the invention envisages using an animated figure or object performing actions indicative of communications actions; for example, when dialling out, a cartoon character could be seen to be dialling a phone key pad or holding a telephone handset to his or her ear. The appearance and/or sound of the animated figure or object serves as a visual and/or oral indication of the communication function being performed.



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## Mobile Telephone with improved man machine interface

5

### Field of the Invention

This invention relates to a mobile telephone and in particular to a mobile telephone with  
10 an improved man machine interface. The term 'mobile telephone' used in this patent  
specification should be expansively construed to cover any kind of mobile device with  
communications capabilities and includes radio telephones, smart phones,  
communicators, and wireless information devices. It includes devices able to  
communicate using not only mobile radio such as GSM or UMTS, but also any other  
15 kind of wireless communications system, such as Bluetooth.

### Description of the Prior Art

20 One of the problems facing the designers of mobile telephone user interfaces (often called  
'man machine interfaces' or 'MMIs') is how to allow the user to comprehend the internal  
status of the mobile telephone. For example, to select or initiate a function (e.g. to open  
an address book function, enter a PIN security number or to alter the ring melody) a user  
has to understand that the status of the telephone is such that the function can be selected  
25 or initiated. A closely related problem is how to enable a user to confidently alter the  
internal status of the phone. This process can be thought of as the problem of how to  
enable a user to confidently navigate through the feature set of the telephone. Because  
many quite intricate operations have to be mastered early on for most mobile telephone  
users (setting security codes, altering ring melodies etc.), it is particularly important to  
30 facilitate the task of navigating to and activating features in the required way.

In addition, mobile telephones offer a very wide (and ever increasing) range of functions. The design of an effective MMI which can be (a) easily navigated by novices yet is (b) flexible enough to enable a large number of functions to be included, is a very challenging task. In fact, it is widely acknowledged that few mobile telephone owners  
5 regularly use any but the most basic telephone features because current MMIs are difficult to fully understand. Hence, the technical problem of effectively enabling the user to understand the internal status of the mobile telephone has to date been inadequately addressed.

10 One of the reasons why many conventional MMIs are inadequate is that mobile telephones are small handheld devices which generally include small display screens. The size of display screens, even for PDA type devices, is far too small to handle a rich and effective MMI, such as the Apple Macintosh Operating System MMI. As a  
15 consequence, MMI designers have tended to use text based MMIs, even though the superiority of graphical user interfaces has long been accepted in the desktop computing environment.

Conventionally, the small display size has also meant that several hierarchies of functions have to be offered to a user: the interface can be thought of as having many layers, with  
20 the user having to first locate the correct top level function and then, within that function, progressively drill down (sometimes through 3 or more layers) to complete the required task. Hence, for example, if a user wishes to enter a new telephone number into an address book stored on the mobile phone, he has to locate a top level function, typically  
25 called 'Address Book'. He then selects that function and is presented with a list of second level functions relevant to the 'Address book' top level function. These second level functions typically include options for reading the contents of the Address Book, entering a new number and password protecting access to the address book. Say the user selects the option for entering a new number; he then is presented with a third level screen display asking him to complete various fields with the contact information.

30

With pure text based, multi-level MMIs, it can be very difficult for users to build up an understanding of the structure of the MMI; without understanding, it is very difficult to navigate extensively.

- 5 Very recently, some manufacturers have introduced GSM mobile telephones which are beginning to move away from the text only MMI. For example, the Philips Xenium telephone can display several icons on screen; Nokia and Mitsubishi have GSM telephones which can display one icon on a screen at a time. Reference may also be made to some PC operating systems and applications, in which a contextual help system is used: when the user places the mouse arrow over an icon, folder etc. for more than a couple of seconds, a help call-out or balloon appears with an explanation of the function of the icon, folder etc.

- 15 It is particularly important that a user understands when a device is actually performing a communications operation (such as dialling out to another telephone; sending a SMS etc.) since mobile telephones are fundamentally used for communications. However, that has conventionally been achieved using text messages (e.g. the word 'Dialling' if the telephone is dialling out). As explained above, purely text based information can be hard to read on the small screen size of many mobile telephones and their exclusive use in MMIs usually gives the MMI a cluttered appearance which is difficult to understand, learn and use.

## 25 Statement of the Invention

In accordance with a first aspect of the present invention, a mobile telephone comprises:  
computing means for storing representations of one or more figures or objects;  
and a

display operable to be controlled by the computing means to display the figures or objects;

characterised in that the display is operable to show a figure or object animated to indicate the status of the mobile telephone as performing a communications function.

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Hence, the invention envisages using an animated figure or object performing actions indicative of communications actions; for example, when dialling out, a cartoon character could be seen to be dialling a phone key pad or holding a telephone handset to his or her ear. The appearance and/or sound of the animated figure or object serves as a visual and/or oral indication of the communication function being performed. When a SMS message is being sent, a flying book could be displayed. Instead of a cartoon character, an image and/or voice of a film or pop star could be used, enabling the mobile telephone to become both an essential merchandising vehicle for film or pop stars and also of great appeal to the youth market. The images of different stars could be downloadable to the mobile telephone.

15

In another aspect, there is provided a mobile telephone in which a caller to the mobile telephone can be placed 'on hold' and the mobile telephone can then cause music and/or a message to be played to the caller whilst the caller remains 'on hold'. The music may be a simple melody (such as are conventionally stored in GSM mobile telephone as ringing alerts) but also music associated with a film or cartoon character, or may be music from a well known musician, particularly pop musician. The message may be spoken by that character or a music or film star. In this way, the owner of a mobile telephone can make a fashion statement to those calling him or her. The film or cartoon character or musician may be the same animated figure as used in the first aspect of the invention.

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### Brief Description of the Drawings

The invention will be further described with reference to the accompanying drawings in which:

- 5           Figure 1 is a schematic depiction of a mobile telephone;  
            Figures 2 and 3 are screen shots of the start up screen;  
            Figure 3 is a screen shot showing one of the animations used when there is an  
            incoming call;  
            Figure 4 is a screen shot showing one of the animations used when there an  
10           outgoing call is being made.

### Detailed Description

- 15   The present invention will be described with reference to a mobile telephone. Several of the functions will be particularly pertinent to third generation UMTS mobile telephones. The mobile telephone is shown generally at 1. It includes the conventional features of a display 2, a start call button 3, an end call button 4 and numeric keys 6. In addition, it also includes a joystick 5, which comprises a short cylindrical member up standing from  
20   the front face of the telephone 1. The joystick can be readily pushed by a user in one of four different directions. The telephone is switched on by the user pressing start call button 3 for in excess of 1 second. Then, a cartoon character as shown in figures 1 and 2 is displayed on the display of the telephone. The cartoon figure is shown in animation waving to the user, indicating to the user that the telephone is starting operations.

- 25   When a user wishes to make a call, he enters the number to be called using numeric keys 6 and then presses the start call button 3. The telephone then communicates with a base station as the first leg of an often complex routing to the destination telephone. To indicate to the user that the mobile telephone is actively engaged in a communications  
30   process, the cartoon character is shown dialling a telephone as in Figure 5. This confirms

to the user the status of the telephone in an easily understood manner which is entirely text free. Many other communications functions of the telephone can be represented by animations of this sort. For example, an incoming call is illustrated with a telephone descending to a cartoon character, as shown in Figure 4. Sending a SMS is associated with a flying book.

Not only does the use of animated characters and/or objects represent an effective way of informing the user that a communications function is occurring, but it also offers a potentially very valuable promotion and merchandising vehicle for TV and film characters, and music artists.

A further feature of this embodiment is that a caller to the mobile telephone can be placed 'on hold' and the mobile telephone can then cause music and/or a message to be played to the caller whilst the caller remains 'on hold'. The music may simply be one of the many melodies as are conventionally stored in GSM mobile telephone as ringing alerts.

In addition, music associated with a film or cartoon character, or may be music from a well known musician, particularly pop musician. The message may be spoken by that character or a music or film star. In this way, the owner of a mobile telephone can make a fashion statement to those calling him or her.

The 'on hold' feature automatically mutes the ringer and the microphone. It plays a melody to the calling party as long as a key is pressed; in this embodiment, it is the start call button or SEND button 3. Or, music etc. could be played for as long as desired; this might be triggered by a long press on the start call button 3, for example. The music 'On-Hold' feature allows one to answer a call during a meeting, for example, step out of the meeting room and then take the call, whilst the caller is provided with music whilst he or she waits. Hence, when the phone rings, the user can accept the call by a short press on the SEND key 3. He can then activate the 'music on hold' feature by a long press on

the SEND key and then, stop that same feature and open the call by another long press on SEND key 3.

- Another feature in this embodiment relates to the use of the numeric keypad to input text:
- 5 the reduced keyboards of conventional GSM mobile telephones typically include 4 rows of 3 buttons. These are primarily allotted to the numbers 0 – 9 and the '\*' and '#' keys. Conventionally, the numeric keys 2 – 9 are each associated with 3 letters as well – e.g. the number key '2' is associated with the letters 'a', 'b' and 'c', the number key '3' is associated with the a triplet of letters 'd', 'e' and 'f' etc. for the entire alphabet. There are
- 10 then two basic approaches to spelling out words. The most rudimentary requires a single press of the key to select the first letter of the triplet, a second press to select the second letter and a third to select the third letter. This is very laborious, especially given the very small size of typical GSM mobile telephone keys.
- 15 The more sophisticated approach requires a disambiguating system such as the Tegic T-9 system determining the correct word through a dictionary look up process. In such a system, a software algorithm determines which word is intended to be input by comparing the various possible 3 letter combinations with an internal dictionary. Hence, in such a case, the user only has to press once on a key. It is up to the software to
- 20 consider the various character strings that are possible, and match them against a dictionary. For example, if the user has pressed the key labelled ABC, then the key labelled DEF, and then indicated that the word has ended, he could have meant AD, AE, AF, BD, BE, BF, CD, CE, CF. Only the letters BE represent an English word, so that word is automatically presented to the user. In the present embodiment, a prediction
- 25 capability is provided. On the top of the screen, the word in the dictionary which is most likely to be meant is displayed: this happens before the user has actually completed the word. If this is actually the word that the user started to key in, he can get it in full by nudging the joystick to the right.



An additional feature of the present embodiment is the ability to take into account names and addresses in the phonebook, databases and any other user defined words/names which the user has entered into the mobile telephone. These user defined words/names become part of the user vocabulary. This underlines the advantage that can be taken of  
5 the synergy between various sources of information managed by the mobile telephone, and more generally, by a PDA.

The dictionary is stored following an order that is directly inherited from the sequence of keys to be typed to input them. For example, the word "best" is written by typing  
10 successively on keys 2aBc, 3dEf, 7pqrS, 8Tuv, so the associated string would be 2378. This way, the dictionary can be accessed quickly on the first character input, thanks to a dichotomy algorithm. A pointer is then put on the first matching sequence. On every new key stroke, the input string is upgraded and the next "first matching sequence" can be easily looked up by moving downwards in the dictionary.

15

The dictionary is compressed. A character is stored on one byte, which allows 256 possibilities. As there is far less than 256 characters, the remaining codes are used to code the most frequently found sequences of 2 characters. According to various studies 2 characters seems to be the optimal length to consider Hoffman code.

## Claims

1. A mobile telephone comprising:  
computing means for storing representations of one or  
more figures or objects; and a display operable to be  
5 controlled by the computing means to display the  
figures or objects; characterised in that the display  
is operable to show a figure or object animated to  
indicate the status of the mobile telephone as  
performing a communications function.
- 10 2. The mobile telephone of Claim 1 which, when dialling  
out, displays a cartoon character dialling a phone  
key pad.
3. The mobile telephone of Claim 1 which, when a SMS  
message is being sent, displays a flying book.
- 15 4. The mobile phone of Claim 1 in which an image and/or  
voice or a film or pop star is used to indicate the  
status of the mobile telephone as performing a  
communications function.
- 20 5. The mobile phone of Claim 4 in which an image and/or  
voice is downloadable to the mobile telephone.
6. A mobile telephone in which a caller to the mobile  
telephone can be placed 'on hold' and the mobile  
telephone can then cause music and/or a message to be  
played to the caller whilst the caller remains 'on  
25 hold'.
7. The mobile telephone of Claim 6 in which the caller  
is placed 'on hold' by the user pressing a key or  
keys.

8. The mobile telephone of Claim 6 in which the music is music associated with a film or cartoon character, or is music from a well known musician, including a pop musician.
- 5 9. The mobile telephone of Claim 8 in which the message is spoken by that character or a music or film star.
10. The mobile telephone of Claim 8 in which an image of a film or cartoon character or musician is used as the animated figure in a telephone as claimed in  
10 Claim 1.

1 / 2

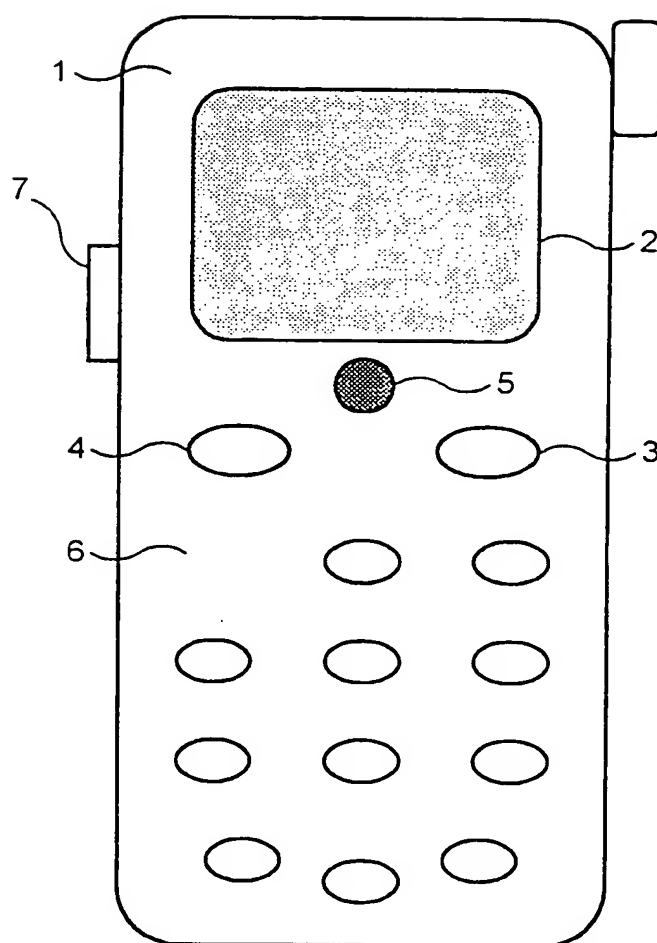


FIG. 1

2 / 2

START UP SCREEN  
ACTUAL SIZE

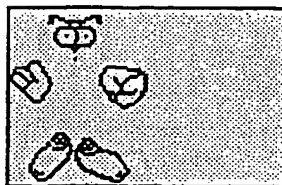


FIG. 2

START UP SCREEN - ENLARGED

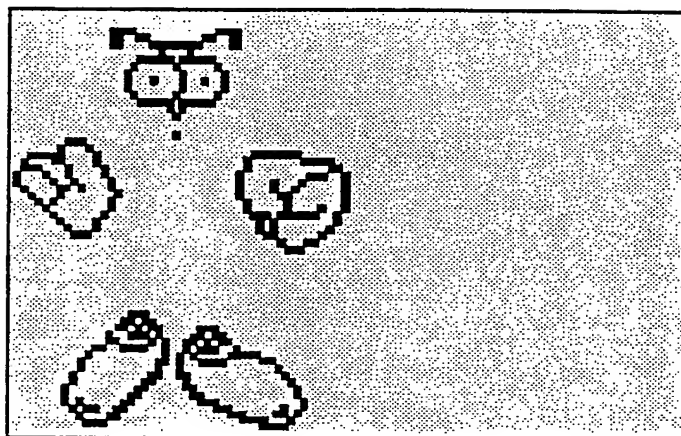


FIG. 3

AN INCOMING CALL

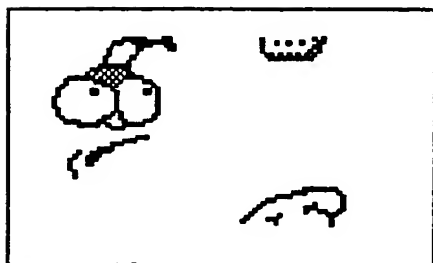


FIG. 4

AN OUTGOING CALL

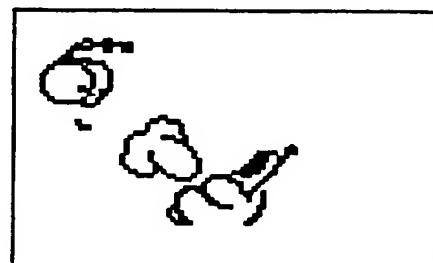


FIG. 5

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[FR/GB]; 3 Daly Way, Aylesbury, Buckinghamshire HP20 1JY (GB).

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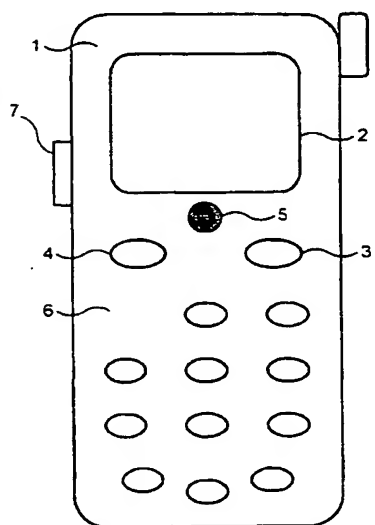
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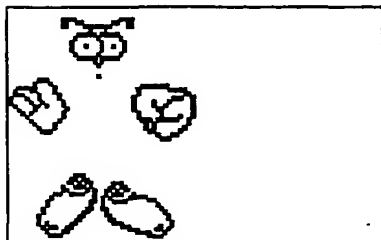
[Continued on next page]

(54) Title: MOBILE TELEPHONE WITH IMPROVED MAN MACHINE INTERFACE



(57) Abstract: Hence, the invention envisages using an animated figure or object performing actions indicative of communications actions: for example, when dialling out, a cartoon character could be seen to be dialling a phone key pad or holding a telephone handset to his or her ear. The appearance and/or sound of the animated figure or object serves as a visual and/or oral indication of the communication function being performed.

START UP SCREEN - ENLARGED



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**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 H04M1/247 H04M1/725

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 295 16 018 U (SIEMENS AG) 7 November 1996 (1996-11-07) page 1, line 7 - line 9 page 1, line 36 -page 2, line 9 page 3, line 1 -page 6, line 19 figures 2-8	1
P,X	EP 0 982 911 A (SHARP KK) 1 March 2000 (2000-03-01) abstract column 1, line 50 -column 2, line 1 column 2, line 22 - line 42 column 5, line 21 - line 35 column 7, line 15 - line 29 column 9, line 32 - line 44 figures 1,2,4	1



Further documents are listed in the continuation of box C



Patent family members are listed in annex.

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Date of the actual completion of the international search

22 November 2001

Date of mailing of the international search report

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# INTERNATIONAL SEARCH REPORT

Int l Application No  
PCT/GB 01/00675

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 831 629 A (NOKIA MOBILE PHONES LTD) 25 March 1998 (1998-03-25) abstract page 3, line 40 -page 4, line 14 page 7, line 38 -page 8, line 16 page 8, line 39 - line 58 page 9, line 7 - line 29 figures 1-4 ---	1-3,5
A	EP 0 855 823 A (SONY CORP) 29 July 1998 (1998-07-29) abstract column 2, line 37 - line 58 column 4, line 5 - line 12 column 5, line 4 - line 9 column 8, line 10 -column 9, line 10 figures 2,7-10,14 ---	1
A	FR 2 778 523 A (ALSTHOM CGE ALCATEL) 12 November 1999 (1999-11-12) abstract page 1, line 9 - line 12 page 2, line 29 -page 3, line 15 page 4, line 14 -page 5, line 13 ---	1
A	US 5 923 737 A (VAN OOSTERHOUT ET AL) 13 July 1999 (1999-07-13) abstract column 1, line 46 -column 2, line 39 column 4, line 31 -column 5, line 8 figure 4 ---	1
X	WO 98 24216 A (PHILIPS ELECTRONICS NV ;PHILIPS NORDEN AB (SE)) 4 June 1998 (1998-06-04) abstract page 1, line 25 -page 2, line 15 page 2, line 34 -page 3, line 1 page 5, line 18 -page 6, line 15 figure 3 ---	6,7
A	US 6 018 671 A (BREMER) 25 January 2000 (2000-01-25) abstract column 1, line 4 - line 6 column 1, line 56 -column 2, line 24 column 3, line 40 -column 4, line 21 figure 1 ---	8
X	GB 2 337 666 A (MATSUSHITA COMMUNICATION IND U) 24 November 1999 (1999-11-24) abstract page 1, line 21 -page 2, line 29 page 3, line 16 -page 4, line 8 figure 1 ---	6,7
	-/--	

# INTERNATIONAL SEARCH REPORT

Int lional Application No

PCT/GB 01/00675

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>EP 0 851 647 A (HITACHI LTD)  1 July 1998 (1998-07-01)  abstract  column 2, line 27 -column 3, line 7  column 6, line 12 - line 51  column 7, line 58 -column 8, line 55  column 9, line 33 - line 44  figures 1,3A  -----</p>	6,7

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/GB 01/00675

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-5

Group I relates to a mobile telephone comprising means for storing and displaying animated objects, images or figures performing an action to show the user the status of the mobile telephone as performing a communication function.

2. Claims: 6-10

Group II relates to a mobile telephone that can maintain "on hold" a telephone call and indicates this state of the communication to the other calling party by playing music or a message.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

Int. Application No

PCT/GB 01/00675

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